

REMARKS

The Office Actions dated April 3, 2006, and August 14, 2006 have been carefully reviewed and the foregoing amendments to the application have been made in consequence thereof.

Claim 1 has been amended to more particularly describe Applicants' invention, specifically the monomer being mixed with a derivatized hematin catalyst in a solvent, wherein the derivatized hematin catalyst has been previously reacted with one or more non-proteinaceous amphipathic groups, and adding a peroxide initiator to the mixture to form, from the aromatic monomer, an electrically conductive polymer.

Claim 2 has been amended to further describe the range of pH values of the solvent.

Claim 3 has been amended to depend on claim 1.

Claims 1-19 remain active in this application.

The examiner rejected claims 1-19 under 35 U.S.C. 103(a) as being unpatentable over Samuelson et al. (6,018,018) in view of Akkara et al. (hematin catalyzed polymerization of phenol compounds.)

Applicants teach mixing a monomer with a derivatized hematin catalyst in a solvent having a pH of about 0.5-4.0. There is no chemical reaction between the monomer and hematin before or after the polymerization of the monomer. Applicants use a derivatized hematin with a monomer in a solvent to form a mixture. Then hydrogen peroxide is added to the mixture to begin the formation of a polymer.

Samuelson et al. teaches the polymerization of aromatic compounds in the presence of different templates using the enzyme Horseradish peroxidase (HRP). The pH

(Column 3 line 57) for the reactions taught by Samuelson et al. is in the range of pH 4-10. HRP is not active/stable between pH 0.5 and 3.0 which is the range taught by Applicants. Consequently HRP cannot be used at very low pH to polymerize any monomers; and therefore, Applicants do not use HRP as a catalyst. The catalytic system taught by Applicants' claims 1-19 is based on derivitized hematin in the pH range of about 0.5-4.0, and Applicants' catalyst is distinctly different from HRP in the ability to retain catalytic activity in low pH (0.5 to 4), and thus, Applicants teach increasing the range of pH for the aromatic polymerization.

Akkara et al. describe the polymerization of aromatic compounds in the presence of hematin, but only hematin, and not derivitized hematin. The pH of Akkara et al. for the reactions is in the range of pH 8-10 as described in the publication of Akkara et al. Please see Table 1., of the publication which states pH = 11.0, and also see Table 2. which describes no results for pH 4.0 and pH 5.0 Furthermore, hematin is not soluble in pH lower than 6.0, and consequently not active between pH 0.5 and 4. The system of Applicants' claims 1-19, comprising a derived hematin (wherein the hematin catalyst has been derived with one or more non-proteinaceous amphipathic groups) is completely soluble and active at low pH, thus increasing the range of pH for the aromatic polymerization. Applicants assert that the derivation of hematin using poly(ethylene glycol) chains is a crucial step for the use of the catalyst at extreme low pH. Applicants' catalytic system is much different from, and is used in a very different environment than, Samuelson et al. and Akkara et al. In addition, Applicants' invention would not be obvious over Samuelson et al. in view of Akkara et al. because Applicants teach an

electrically conductive polymer, whereas Akkara et al. do not, and Samuelson et al. cannot operate at low pH.

Thus, applicants respectfully aver that claims 1-19 would not be obvious to one skilled in the art over Samuelson et al. in view of Akkara et al.

This is a Request for Continuing Examination, and it is being submitted to continue the prosecution of this application. In view of the foregoing amendments and remarks, it is believed that claims 1-3, as amended, and claims 4-19 in this application are allowable and Notice to that effect is respectfully solicited.

Should the Examiner wish to contact Applicants' attorney regarding this application, the Examiner is respectfully invited to do so by calling or writing the undersigned in the Office of Counsel, U.S. Army Soldier Systems Center, Natick, MA 01760 at (508)233-4510.

Respectfully submitted,

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Date

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